

## *Endangered, Threatened, and Rare Species*

Plant and animal species are vanishing at an alarming rate. It is difficult to estimate the overall rate of extinction. Some species, like the larger birds and mammals, are more susceptible to extinction than most. The same is true of fishes limited to one or two freshwater streams. Most kinds of insects and small organisms are so difficult to monitor as to make exact numbers unattainable. Nevertheless, biologists using several indirect methods of analysis generally agree that on the land at least and on a worldwide basis, species are vanishing 1,000 times faster than before the arrival of humans (Wilson, 1992). This is the highest rate since the Mesozoic Era 65 million years ago, which was marked by the mass extinction of dinosaurs.

While climate change and overexploitation were major forces in past extinctions, habitat loss is by far the most significant force in present-day extinction. A primary cause of habitat loss is urbanization and its associated decreases in natural vegetation areas such as forestlands and wetlands. Wetland losses can be attributed to development, the creation of ponds and reservoirs, agricultural practices, and sea level rise. Between 1950 and late 1970s, freshwater wetlands in the Chesapeake Bay watershed were lost at an annual rate of over 2,800 acres (U.S. EPA, 1999a). Within the Bay watershed in the past 25 years, forests have been lost mostly to urbanization and partly to agricultural conversion at a rate of nearly 100 acres per day (U.S. EPA, 1999b). As urbanization increases, the function/value of the remaining natural habitat can be impaired by fragmentation and stressed by impacts/influences (e.g., pollution) from surrounding developed land. When coupled with habitat losses at the larger landscape level, local losses can threaten the survival of not only individual species, but of entire communities. Especially vulnerable are those species with more-specialized habitat requirements, and migratory species with multiple habitat requirements.

Within the U.S., federal land holdings such as DoD installations play a key role in the protection and restoration of declining species. DoD has demonstrated that it is possible to manage its lands to support the military mission and to promote species protection/restoration. DoD's shift in focus in the 1990s toward ecosystem management provides greater protection for declining species. A 1996 document, *Conserving Biodiversity on Military Lands: A Handbook for Natural Resources Managers*, provides guidance and tools for natural resource managers on DoD installations to conserve ecosystems and rare species while maintaining military readiness (Leslie, 1996). One example of the successful combination of species protection and military mission is the 1996 issuance by the Army of new rules for the preservation of red-cockaded woodpecker populations. These rules, while greatly expanding available maneuver space in training areas, also provide red-cockaded woodpecker habitat improvements and better species management (U.S. Army, 1997).

Under the Endangered Species Act of 1973, plant and animal species in danger of extinction throughout all or a significant part of their range are listed as "endangered." Species that are likely to become endangered within the foreseeable future throughout all or a significant part of their range are listed as "threatened." Endangered and threatened listings impart protective status

to the listed species and their habitats. Additional designations under the Endangered Species Act are “proposed endangered” and “proposed threatened,” for species awaiting additional data to determine the need for listing; “candidate” where the data support a species listing, but the listing procedure has been delayed; and “species of concern” for species under consideration for listing. These latter listings do not impart any protective status.

States, including Virginia, have state endangered species acts that provide “endangered” and “threatened” listings and protection status for species vulnerable to extinctions at the state level. States also have Natural Heritage Programs that maintain listings and rarity (i.e., conservation) rankings of rare plant and animal species, and ecological communities. Unlike endangered and threatened listings, rare species listings and their rankings are not legal designations, and do not provide any protective status. They are used to prioritize resources for conservation.

Virginia’s Department of Conservation and Recreation, Division of Natural Heritage (DCR-NHP) rates individual species and communities with resource conservation rankings from S1 (extremely rare) to S5 (very common). DCR-NHP rates specific sites of these species and communities with site conservation rankings of B1 (outstanding significance) to B5 (general biodiversity significance).

Fort Belvoir has one federal-listed species: the threatened bald eagle. There are no federal-listed endangered species, candidate or proposed species, or federal species of concern, on Fort Belvoir. There are no designated critical habitats for federal-listed species on Fort Belvoir.

While the bald eagle’s demise was largely a result of pollution (i.e., organochlorine pesticides, which caused eggshell thinning and reproductive failure), this species’ recovery remains vulnerable to habitat loss. The U.S. Fish and Wildlife Service’s Chesapeake Bay Bald Eagle Recovery Program (which includes eagles of the Fort Belvoir area) sets the following goals for recovery of the Chesapeake Bay bald eagle population: (1) a nesting population of 300 to 400 pairs with an annual nest productivity of 1.1 young per nest sustained over five years, and (2) permanent protection of sufficient roosting habitat (considered to be at least 30 percent of suitable habitat) (U.S. FWS, 1990). The nesting population goal is anticipated to be met in 2000; however, the habitat goal has not been met.

Bald eagle habitat is confined to near-shore areas. Within the Chesapeake Bay region, much of this area is in private ownership. If the bald eagle were to be de-listed, as is being considered by USFWS, the habitat protection presently afforded under the Endangered Species Act would be lifted, making these areas more easily developed. With an anticipated increase in the Chesapeake Bay region human population of 2.5 million persons by 2020, and the current political pressure to de-list the bald eagle, there is concern that sensitive bald eagle habitat will be lost to development. The USFWS is presently evaluating how to protect bald eagle habitat if the eagle is removed from Endangered Species Act listing. It is reasonable to anticipate that federal landholders will be expected to provide continued protection of bald eagle habitat in the event that this species is de-listed.

Fort Belvoir has three state-listed species that occur on post on a regular basis: the state-listed endangered bald eagle, the state-listed threatened wood turtle (*Clemmys insculpta*), and the state-listed endangered peregrine falcon (*Falco peregrinus*) that occurs during fall migration (Figure

12.1). The wood turtle is at the southernmost limit of its range in northern Virginia. This is a highly mobile species with complex habitat requirements. The wood turtle was listed as state threatened in 1991. This species has rapidly disappeared from northern Virginia in the past 20 years, principally due to loss of habitat to development (Ernst et al., 1997a). The peregrine falcon has been regularly recorded on Fort Belvoir for the past three years as it migrates through the area and takes advantage of foraging habitat along the Accotink Stream / Accotink Bay stream corridor.

The Northern Virginia well amphipod (*Stygobromus phreaticus*) was first discovered during surveys at Fort Belvoir conducted by DCR-NHP from April 1996 through October 1996. This was the first known sighting of the amphipod since its collection from wells in Vienna in 1941 and Alexandria in 1948 (Hobson, 1997). Little is known about the amphipod; it is not state or federally listed but is referred to as “globally rare” (Sauseville, 2000). It has been noted, however, that “this species may be particularly sensitive to groundwater contamination and pollution as well as withdraw of water from subterranean habitats” (Thorpe, 1991).

Eighty-nine plant and animal species with state rarity/conservation rankings of either S3 (“rare to uncommon”), S2 (“very rare”), or S1 (“extremely rare”) have been identified as occurring on Fort Belvoir (Table 12.2).<sup>1</sup> In addition, seven rare ecological community types have been identified as having rankings of S3, S2, or S1 (Section 9.2.2; Table 9.3). These communities are presented in Figure 12.2. DCR-NHP has delineated the boundaries of three areas on Fort Belvoir to encompass all of the rare plant species and rare ecological communities, and most of the rare animal species. DCR-NHP ranked one of these areas as B1 (outstanding significance), one as B3 (high significance) and one as B5 (general biodiversity significance) (Hobson, 1996; 1997; McCoy and Fleming, 2000) (Figure 8.2).

## **12.1 ENDANGERED, THREATENED, AND RARE SPECIES POLICIES**

### **12.1.1 Federal Endangered, Threatened, and Rare Species Policy**

The Endangered Species Act of 1973, 16 USC §§ 1531-1543, was enacted to protect plant and animal species considered to be in danger of extinction. The Act affords legal protection to species listed as endangered and threatened, including protection of their habitats. The USFWS makes the listings (as well as downlistings and de-listings) of endangered and threatened species on the basis of the species’ population, it’s biological vulnerability and threats to its survival. The USFWS also develops and implements recovery plans for listed endangered species.

The Endangered Species Act establishes the federal government’s responsibility for protection and recovery of species considered to be in danger of extinction. The act requires federal agencies to undertake affirmative actions to protect and restore populations of listed threatened and endangered species, and to prevent proposed and candidate species from being listed.

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<sup>1</sup> This number includes all rare species with S1, S2, or S3 rankings, with the exception of four species with rankings of either SU or SH.

Two additional federal regulations protect endangered and threatened wildlife species. The Fish and Wildlife Coordination Act (16 U.S. C. 661 et seq.) includes provisions for the protection of bald and golden eagles (Chapter 5A, subchapter II) and endangered species of fish and wildlife (Chapter 5A, subchapter III). The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) prohibits the pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, disturbing, purchase, or sale of bald and golden eagles. The act also prohibits the barter, transport, export, or import at any time or in any manner a bald or golden eagle, dead or alive; or any part, nest, or egg of these eagles, unless pursuant to a permit or regulation. Violators may be subject to criminal and civil penalties. The act is enforced by the Department of Interior employees, who have the authority to make arrests without warrants and to conduct warrant searches.

### **12.1.2 State Endangered, Threatened, and Rare Species Policy**

The Commonwealth of Virginia's two state endangered species acts were enacted to protect plant and animal species from extinction at the state level. One (§ 29.1-563, Code of Virginia), administered by the Virginia Department of Game and Inland Fisheries, addresses fish and wildlife, excluding insects. The other (§§ 3.1-1020 through 1030, Code of Virginia) administered by the Virginia Department of Agriculture and Consumer Services addresses plants and insects.

The Virginia Natural Area Preserves Act of 1989 (§§ 10.1-209 through 217, Code of Virginia) established the Virginia Department of Conservation and Recreation, Division of Natural Heritage as the state agency responsible for inventory, database maintenance, protection and management of Virginia's natural heritage resources (i.e., the habitats of rare, threatened, or endangered plant and animal species, rare or state significant communities, and other natural features). DCR-NHP is part of an international network of natural heritage programs, coordinated by The Nature Conservancy, which uses standardized inventory methodologies and the Biological and Conservation Data System technology (Hobson, 1996). DCR-NHP makes rarity/conservation rankings, and makes site-specific element occurrence rankings and biodiversity rankings through natural heritage inventories.

### **12.1.3 Department of Defense Endangered, Threatened, and Rare Species Policy**

DoD's natural resources management policy is contained within DoDI 4715.3, *Environmental Conservation Program*. This instruction requires installations to follow an ecosystem-based approach to natural resources management, to inventory and protect important biological resources, and to promote biodiversity. The instruction also allows for multiple uses of an installation's natural resources, and for public access to these resources for recreation, education and scientific research and study, compatible with the installation's ecosystem management goals. DoD's policy on threatened and endangered species management, as established in DoDI 4715.3, is as follows:





- Wood Turtle Observation Point
- Important Wood Turtle Habitat
- Peregrine Falcon/Bald Eagle High Use Forage Area
- Bald Eagle High Use Forage Areas
- Bald Eagle Occasional Use Forage Areas
- Bald Eagle Nesting Habitat



# THREATENED and ENDANGERED SPECIES HABITAT on FORT BELVOIR

SOURCE: PACIULLI, SIMMONS & ASSOCIATES,  
LTD., 2000; CLINE, 1996; UNPUBLISHED DATA

FIGURE: 12.1





- |   |  |   |   |
|---|--|---|---|
|  | Tidal Freshwater Marsh: Spikeweed-Golden-club Type |  | Coastal Plain/Piedmont Acidic Seepage Swamp |
|  | Tidal Freshwater Marsh: Wild Rice-Smartweed Type   |  | Tidal Hardwood Swamp                        |
|  | Tidal Freshwater Marsh: Mud Flat Type              |  | Tidal Shrub Swamp                           |
|  | Tidal Freshwater Marsh: Mixed Type                 |   |   |



RARE PLANT COMMUNITIES  
 MAPPED by VIRGINIA NATURAL  
 HERITAGE INVENTORY  
 on FORT BELVOIR

SOURCE: MCCOY AND FLEMING, 2000

FIGURE 12.2



**Excerpts from DoDI 4715.3**  
**Select Provisions Applicable to Endangered, Threatened, and Rare Species**

- Threatened and endangered species management and recovery efforts on DoD lands and waters shall be consistent with Section 1531 *et seq.* of 42 (sic) U.S.C (reference (d)) and other legal mandates. Procedures to comply with these mandates shall emphasize military mission requirements and inter-agency cooperation during consultation, species recovery planning, and management activities. Opportunities to conserve Federally listed species and the ecosystems on which those species depend shall be identified. The Department of Defense shall accept an unequal or disproportionate burden for the conservation of threatened and endangered species only when it is required by legal authority or it has been expressly determined that it is in the Department of Defense's best interest. (D.2.d)
- Biologically or geographically significant or sensitive natural resources (e.g., wetlands, forests, floodplains, watersheds, estuaries, riparian areas, coastal barrier islands, marine sanctuaries, critical habitats, animal migration corridors) or species (e.g., threatened or endangered species, certain marine mammals, and migratory birds) shall be inventoried and managed to protect these resources, and to promote biodiversity, using the goals identified in paragraph F1a. (D2c)
- All DoD conservation programs shall work to guarantee continued access to our land, air, and water resources for realistic military training and testing while ensuring that the natural and cultural resources entrusted to DoD care are sustained in a healthy condition for scientific research, education, and other compatible uses by future generations. (D1a)

#### **12.1.4 Department of the Army Endangered, Threatened, and Rare Species Policy**

The Army's natural resources management policy is contained within AR 200-3, *Natural Resources—Land, Forest and Wildlife Management*. This regulation establishes the Army's requirements for managing and using land and water resources in accordance with the principles of ecosystem management, and institutes the Army's commitment to conserve, protect, and sustain biological diversity, and to restore degraded ecosystems. AR 200-3 also establishes the Army's commitment to carry out mission and program requirements that are consistent with the requirements of the Endangered Species Act, be sensitive to those species listed as endangered or threatened under state law, and prepare endangered species management plans for listed and proposed species. The Army's policy on threatened and endangered species management, as established in AR 200-3, follows:

**Excerpts from AR 200-3**  
**Select Provisions Applicable to Endangered, Threatened, and Rare Species**

- DA personnel at all levels must ensure that they carry out mission requirements in harmony with the requirements of the Endangered Species Act (ESA) of 1973, section 1531 to 1544, title 16, United States Code (16 U.S.C. 1531- 1544). (11-1a)

**Excerpts from AR 200-3  
Select Provisions Applicable to Endangered, Threatened, and Rare Species**

*(continued)*

- Section 7(a)(1) of the ESA requires the Army to carry out programs for the conservation of listed species... Therefore, the Army has a responsibility to take affirmative measures to increase, as well as to avoid actions likely to jeopardize, listed species... (Para. 11-2a)
- Installations will avoid taking actions that result in the need to list candidate species as threatened or endangered. (11-4a)
- Installations are encouraged to develop ESMPs [Endangered Species Management Plans] for candidate species, and to participate in conservation agreements with the FWS. (11-4a)
- Army installations must be sensitive to those species listed as endangered or threatened under State law, but not federally listed. Whenever feasible, installations should cooperate with State authorities in efforts to conserve these species. There is no requirement for ESMPs for State-listed species. Installations, however, will identify State-listed species in the installation's cooperative plan and set forth agreed conservation measures. (11-4b)
- Installations will prepare ESMPs for listed and proposed species and critical habitat present on the installation ... (11-5a(1))
- The natural resources management professional will be an active participant in all planning and decision making activities regarding uses of the land to ensure that current and planned mission activities (for example, master planning, construction requests, site approval requests, and training exercise plans) are conducted in a manner which is compatible with natural resources and other environmental requirements. (3-2b)

### **12.1.5 Fort Belvoir Endangered, Threatened, and Rare Species Policy**

Fort Belvoir does not have installation-specific policy regarding endangered, threatened, and rare species management. Rather, management actions are guided directly by federal, state, DoD and DA policy.

## **12.2 ENDANGERED, THREATENED, AND RARE SPECIES BASELINE CONDITIONS**

Information on endangered and threatened rare plant and animal species, and rare ecological communities of Fort Belvoir has been obtained through various surveys. The results of these surveys have been incorporated into the installation GIS.

In 1997, DCR-NHP completed a multi-year natural heritage inventory survey (Hobson, 1996; 1997). The purpose of the inventory was to systematically identify the installation's natural heritage resources: those sites supporting unique or exemplary natural communities, rare plants and rare animals, and other significant natural areas. The natural heritage inventory identified



three installation areas with significant biodiversity, all of which included wetlands: (1) the Pohick Creek-Pohick Bay-lower Accotink Creek-Accotink Bay wetland complex; (2) the upper Dogue Creek wetland complex; and, (3) the T-17 ravine seeps (Figure 8.2). These areas included one federal-listed threatened/state-listed endangered animal species (bald eagle), one state-listed threatened species (wood turtle), four rare plants and seven rare animals (Table 12.1), along with two broadly defined rare wetland community types, and one rare upland community type as occurring on Fort Belvoir. No federal or state-listed threatened or endangered plant species were identified on post during the inventory.

In 2000, DCR-NHP completed an ecological communities assessment of Fort Belvoir Main Post (McCoy and Fleming, 2000). This assessment was undertaken as an expansion and follow-on to the DCR-NHP natural heritage inventory. The purpose of the ecological communities assessment was to develop an ecological-based definition and description of the ecological communities on post, consistent with The Nature Conservancy's National Vegetation Classification system. The ecological communities assessment defined and described the communities in greater detail than was done in the previous natural heritage inventory, and addressed plant relationships with site environmental conditions (e.g., hydrology, soil chemistry). The ecological communities assessment confirmed the high biodiversity of the Fort Belvoir wetland communities, as previously reported by the natural heritage inventory, and assigned these communities a high priority for conservation.

Other survey efforts contributing information on installation endangered, threatened and rare species include aquatic surveys (Ernst et al., 1995; and EA, 2000); wildlife surveys (Ernst et al., 1990, 1997a, 1997b, 1998); and, avian inventory and monitoring surveys (Fischer et al., 1999) undertaken in coordination with the Partners in Flight program (Section 11).

### **12.2.1 Bald Eagle**

The bald eagle (*Haliaeetus leucocephalus*) is the only federal-listed species known to inhabit Fort Belvoir. It is listed as threatened by the USFWS and endangered by the VDGIF. Fort Belvoir provides valuable nesting, foraging and loafing habitat for resident and migratory bald eagles. The installation has one active nest site in the Accotink Bay Wildlife Refuge (ABWR). The nest site has been active since 1990, fledging 11 eaglets from 1990 through 2000. The installation shoreline along Pohick Creek, Pohick Bay, Accotink Bay, Accotink Creek, Gunston Cove, Potomac River and Dogue Creek is used year-round by bald eagles as foraging and loafing habitats. The shoreline extending from Pohick Creek and around Accotink Creek within the ABWR is a high-use foraging area with the greatest eagle activity occurring during the winter. In recognition of the importance of this shoreline, in 1997 the VDGIF officially added this shoreline to the Mason Neck Eagle Concentration Area. This is one of only five such designated Eagle Concentration Areas in all of Virginia.

Potential threats to bald eagle nesting, foraging and loafing habitat include disturbances caused near shore by boating and jet ski activity, possible increase in training activity, development of areas adjacent to eagle nesting areas, and hunting of waterfowl.

### 12.2.2 Peregrine Falcon

The peregrine falcon (*Falco peregrinus*) is a state-listed endangered species. The peregrine falcon occurs along the Accotink Creek/Accotink Bay stream corridor during fall migration. This area of Fort Belvoir provides valuable foraging habitat for migratory falcons. Falcons have been recorded on Fort Belvoir during the last three fall migrations (six sightings in 1998, four in 1999 and three in 2000).

Potential threats to the peregrine falcon foraging habitat include disturbances near the shoreline, shoreline development, and waterfowl hunting.

### 12.2.3 Wood Turtle

The wood turtle (*Clemmys insculpta*) is the only state-listed threatened species known to inhabit Fort Belvoir.<sup>2</sup> The wood turtle is found primarily in mesic deciduous woodlands in and near clear creeks in Fairfax County (Ernst et al., 1997a). The wood turtle is very mobile and is a highly terrestrial species that typically uses creeks for hibernacula and mating.

The wood turtle was first observed in the Jackson Miles Abbott Wetland Refuge (JMAWR) near the western edge of the marsh in 1988 (Belfit, 1988, as cited in Hobson, 1996). Despite continuous searches, no other sightings were made on Fort Belvoir for ten years. In 1998 two wood turtles were observed on Fort Belvoir, a female along Dogue Creek near the JMAWR, and a male along Accotink Creek near U.S. Route 1. In 1999, a different male was observed along Accotink Creek in the ABWR. Huntley Meadows Park, to the northeast of the JMAWR, has a population of wood turtles that have been monitored for several years. The recent sightings of three different individuals within the Dogue Creek and Accotink Creek corridors on Fort Belvoir indicate that this species is established on post. Figure 12.1 identifies the installation areas that are considered to possess wood turtle habitat.

Development and stormwater runoff are the two main site-specific and local threats to the wood turtle population on Fort Belvoir. Development-related alterations to riparian forest buffers could affect water quality, stream flow and stream channels, and reduce the habitat area required for the wood turtle.

### 12.2.4 Rare Species

The Fort Belvoir Natural Heritage Inventories (Hobson, 1996; 1997) (Figure 12.3) (Section 9.2.3) identified seven Virginia state rare animal species and four Virginia state rare plant species on the installation.<sup>3</sup> The inventory also identified 16 state watchlist animal species and three state watchlist plant species on Fort Belvoir (Table 12.1). Each of these species was documented as occurring in aquatic and/or wetland habitats on Fort Belvoir.

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<sup>2</sup> Two other state-listed threatened species, the loggerhead shrike (*Lanius ludovicianus*) and upland sandpiper (*Bartramia longicauda*) have been sighted in the past on Fort Belvoir, but none have been sighted during the past 3 years of bird surveys.

<sup>3</sup> With the exception of *Lampsilis radiata* (eastern lampmussel), all other species were found living. The lampmussel found was an empty shell.







The list of rare animal species provided in the Natural Heritage Inventory report (Hobson, 1996; 1997) does not contain the complete list of rare animals that occur on Fort Belvoir. This is mainly because the inventory surveyed areas that were determined to have high potential for rare species or exemplary vegetation communities rather than surveying throughout the post. In addition, the Virginia rare animal species list is a “living” list that is updated annually. This necessitates regular cross-referencing with species documented on the installation. Table 12.2 presents a comprehensive listing of all birds, mammals, reptiles, and amphibians that have been documented as occurring on post and that have been designated as a Virginia state-rare species with a state rarity rank of either S1, S2, or S3.<sup>4</sup>

<b>Table 12.1: Virginia Natural Heritage Ranked Species Identified by the 1996-1997 Natural Heritage Inventory</b>			
	<i>Scientific Name</i>	<i>Common Name</i>	<i>DCR-NHP Status</i>
State Rare Animals	<i>Ischnura prognata</i>	furtive forktail	S2/S3
	<i>Ixobrychus exilis</i>	least bittern	S2
	<i>Lampsilis radiata</i>	eastern lampmussel	S2
	<i>Nehalennia gracilis</i>	sphagnum sprite	S2
	<i>Neurocordulia obsoleta</i>	umber shadowfly	S2
	<i>Stygobromus phreaticus</i>	Northern Virginia well amphipod	S1
	<i>Utterbackia imbecillis</i> - <i>Anodonta imbecillis</i>	paper pondshell	S2
State Rare Plants	<i>Carex vestita</i>	velvet sedge	S2
	<i>Lathyrus palustris</i>	vetchling	S1
	<i>Ranunculus ambigens</i>	water-plantain spearwort	S2
	<i>Scirpus fluviatilis</i>	river bulrush	S1
State Watchlist Animals	<i>Amphiagron saucium</i>	eastern red damsel	Watchlist
	<i>Ardea herodias</i>	Great Blue Heron	Watchlist
	<i>Brachymesia gravida</i>	four-spotted pennant	Watchlist
	<i>Chromagrion conditum</i>	aurora damsel	Watchlist
	<i>Cordulegaster erronea</i>	tiger spiketail	Watchlist
	<i>Cordulegaster obliqua</i>	arrowhead spiketail	Watchlist
	<i>Enallagma durum</i>	big bluet	Watchlist
	<i>Erythrodiplax minuscula</i>	little blue dragonlet	Watchlist
	<i>Lampetra aepyptera</i>	least brook lamprey	Watchlist
	<i>Leptodea ochracea</i>	tidewater mucket	Watchlist
	<i>Lestes inaequalis</i>	elegant spreadwing	Watchlist
	<i>Notropis bifrenatus</i>	bridle shiner	Watchlist
	<i>Stygobromus tenuis</i>	Potomac groundwater amphipod	Watchlist
	<i>Stylurus plagiatus</i>	russet-tipped clubtail	Watchlist
	<i>Sympetrum ambiguum</i>	blue-faced meadowfly	Watchlist
	<i>Tachopteryx thoreyi</i>	gray petaltail	Watchlist
State Watchlist Plants	<i>Eleocharis smallii</i>	creeping spikerush	Watchlist
	<i>Iris versicolor</i>	blueflag	Watchlist
	<i>Sparganium eurycarpum</i>	large bur-reed	Watchlist

Source: Hobson, 1996 and 1997.

<sup>4</sup> Partners in Flight species are discussed in Section 11.



**Table 12.2: Commonwealth of Virginia and Natural Heritage Ranked Species That Have Been Identified on Fort Belvoir**

<i>Scientific Name</i>	<i>Common Name</i>	<i>Taxon</i>	<i>Virginia Status*</i>	<i>DCR-NHP Status†</i>
<i>Condylura cristata</i>	Star-nosed mole	Mammal	—	S3
<i>Lasionycteris noctivagans</i>	Silver-haired bat	Mammal	—	S3
<i>Lasiurus cinereus</i>	Hoary bat	Mammal	—	SU
<i>Myotis leibii</i>	Small-footed bat	Mammal	—	S1
<i>Accipiter cooperi</i>	Cooper's hawk	Bird	—	S1S2
<i>Accipiter striatus</i>	Sharp-shinned hawk	Bird	—	S3S4
<i>Actitis macularia</i>	Spotted sandpiper	Bird	—	S2
<i>Aegolius acadicus</i>	Northern saw-whet owl <sup>‡</sup>	Bird	SC	S1
<i>Anas discors</i>	Blue-winged teal	Bird	—	S1
<i>Anas strepera</i>	Gadwall	Bird	—	S2
<i>Aquila chrysaetos</i>	Golden eagle <sup>‡</sup>	Bird	—	SH
<i>Ardea alba</i>	Great egret	Bird	SC	S2BS4N
<i>Ardea herodias</i>	Great blue heron	Bird	—	S3S4
<i>Asio flammeus</i>	Short-eared owl <sup>‡</sup>	Bird	—	S1
<i>Asio otus</i> <sup>c</sup>	Long-eared owl <sup>‡</sup>	Bird	SC	S1
<i>Bartramia longicauda</i>	Upland sandpiper <sup>‡</sup>	Bird	LT	S1S2
<i>Botaurus lentiginosus</i>	American bittern	Bird	—	SU
<i>Carpodacus purpureus</i>	Purple finch	Bird	SC	S1
<i>Catharus guttatus</i>	Hermit thrush	Bird	SC	S1
<i>Catharus ustulata</i>	Swainson's thrush	Bird	—	S1
<i>Certhia familiaris</i>	Brown creeper	Bird	SC	S2S3
<i>Circus cyaneus</i>	Northern Harrier	Bird	SC	S1S2
<i>Cistothorus platensis</i>	Sedge wren	Bird	SC	S1
<i>Contopus borealis</i>	Olive-sided flycatcher	Bird	—	SH
<i>Dendroica fusca</i>	Blackburnian warbler	Bird	—	S2
<i>Dendroica magnolia</i>	Magnolia warbler	Bird	SC	S1S2
<i>Dolichonyx oryzivorus</i>	Bobolink	Bird	—	S1
<i>Egretta caerulea</i>	Little blue heron	Bird	SC	S2B, S4N
<i>Egretta thula</i>	Snowy egret	Bird	—	S2
<i>Empidonax alnorum</i>	Alder flycatcher	Bird	SC	S1
<i>Empidonax flaviventris</i>	Yellow-bellied flycatcher	Bird	SC	S1
<i>Falco peregrinus</i>	Peregrine falcon	Bird	LE	S1
<i>Fulica americana</i>	American coot	Bird	—	S1
<i>Gallinula chloropus</i>	Common moorhen	Bird	SC	S1
<i>Haliaeetus leucocephalus</i>	Bald eagle	Bird	LE	S2
<i>Ixobrychus exilis</i>	Least bittern	Bird	—	S2
<i>Lanius ludovicianus</i>	Loggerhead shrike	Bird	LT	S2
<i>Larus atricilla</i>	Laughing gull	Bird	—	S3S4
<i>Lophodytes cucullatus</i>	Hooded merganser	Bird	—	S1
<i>Loxia curvirostra</i>	Red crossbill	Bird	SC	S1
<i>Melospiza georgiana</i>	Swamp sparrow	Bird	—	S1
<i>Mergus merganser</i>	Common merganser	Bird	—	S1
<i>Nycticorax nycticorax</i>	Black-crowned night heron	Bird	—	S2S3
<i>Nycticorax violacea</i>	Yellow crowned night heron	Bird	SC	S2

**Table 12.2: Commonwealth of Virginia and Natural Heritage Ranked Species That Have Been Identified on Fort Belvoir**

<i>Scientific Name</i>	<i>Common Name</i>	<i>Taxon</i>	<i>Virginia Status*</i>	<i>DCR-NHP Status†</i>
<i>(continued)</i>				
<i>Oporonis philadelphia</i>	Mourning warbler	Bird	SC	S1
<i>Petrochelidon pyrrhonota</i>	Cliff swallow	Bird	—	S3S4
<i>Phalacrocorax auritus</i>	Double-crested cormorant	Bird	—	S1B, S4N
<i>Plegadis falcinellus</i>	Glossy ibis <sup>c</sup>	Bird	SC	S2
<i>Podilymbus podiceps</i>	Pied-billed grebe	Bird	—	S2
<i>Porzana carolina</i>	Sora	Bird	—	S1
<i>Rallus elegans</i>	King rail	Bird	—	S2
<i>Rallus limicola</i>	Virginia rail	Bird	—	S2
<i>Regulus calendula</i>	Golden-crowned kinglet	Bird	SC	S2
<i>Riparia riparia</i>	Bank swallow	Bird	—	S3S4
<i>Seiurus noveboracensis</i>	Northern waterthrush	Bird	—	S1
<i>Sitta candensis</i>	Red-breasted nuthatch	Bird	SC	S2
<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker	Bird	—	S1
<i>Sterna antillarum</i>	Least tern	Bird	SC	S2
<i>Sterna caspia</i>	Caspian tern	Bird	SC	S1
<i>Sterna forsteri</i>	Forster's tern	Bird	SC	S3S4
<i>Sterna hirundo</i>	Common tern	Bird	—	S3
<i>Troglodytes troglodytes</i>	Winter wren	Bird	SC	S2
<i>Vermivora chrysoptera</i>	Golden-winged warbler	Bird	SC	S3
<i>Vermivora ruficapilla</i>	Nashville warbler	Bird	—	S1
<i>Clemmys guttata</i>	Spotted turtle	Reptile	—	S3S4
<i>Clemmys insculpta</i>	Wood turtle	Reptile	LT	S2
<i>Stygobromus phreaticus</i>	Northern Virginia well amphipod	Crustacean	—	S1
<i>Stygobromus tenuis</i>	Potomac amphipod	Crustacean	—	S3
<i>Lampetra aepyptera</i>	Least brook lamprey	Fish	—	S3
<i>Notropis bifrenatus</i>	Bridle shiner	Fish	SC	S2/S3
<i>Amphiagron saucium</i>	Eastern red damsel	Insect	—	S3
<i>Brachymesia gravida</i>	Four-spotted pennant	Insect	—	S3
<i>Chromagrion conditum</i>	Aurora damsel	Insect	—	S3
<i>Cordulegaster erronea</i>	Erroneous biddie	Insect	—	S3
<i>Cordulegaster obliqua</i>	Arrowhead spiketail	Insect	—	S3
<i>Enallagma durum</i>	Big bluet	Insect	—	S3
<i>Erythrodiplax minuscule</i>	Blue dragonlet	Insect	—	S3
<i>Ischnura prognata</i>	Furtive forktail	Insect	—	S3
<i>Lestes inaequalis</i>	Elegant spreadwing	Insect	—	S3
<i>Nehalennia gracilis</i>	Sphagnum sprite	Insect	—	S2
<i>Neurocordulia obsoleta</i>	Umber shadowdragon	Insect	—	S3
<i>Stylurus plagiatus</i>	Russet-tipped clubtail	Insect	—	S3
<i>Sympetrum ambiguum</i>	Blue-faced meadowfly	Insect	—	S3
<i>Tachopteryx thoreyi</i>	Gray petaltail	Insect	—	S3
<i>Lampsilis radiata</i>	Eastern lampmussel	Mollusk	SC	S2
<i>Leptodea ochracea</i>	Tidewater mucket	Mollusk	—	S3
<i>Arenaria lateriflora</i>	Sandwort	Plant	—	S1



**Table 12.2: Commonwealth of Virginia and Natural Heritage Ranked Species That Have Been Identified on Fort Belvoir**

<i>Scientific Name</i>	<i>Common Name</i>	<i>Taxon</i>	<i>Virginia Status*</i>	<i>DCR-NHP Status†</i>
<i>(continued)</i>				
<i>Blephilia hirsuta</i>	Hairy woodmint	Plant	—	S3
<i>Botrychium oneidense</i>	Blunt-lobed grape fern	Plant	—	S2
<i>Calamovilfa brevipilis</i>	Pine barrens reedgrass	Plant	—	S1
<i>Carex vestita</i>	Velvety sedge	Plant	—	S2
<i>Eleocharis equisetoides</i>	Spike-rush	Plant	—	S1
<i>Eleocharis smallii</i>	Creeping spikerush	Plant	—	S3?
<i>Iris versicolor</i>	Blueflag	Plant	—	S3
<i>Lathyrus palustris</i>	Vetchling	Plant	—	S1
<i>Ranunculus ambigens</i>	Water plantain crowfoot	Plant	—	S1
<i>Scirpus fluviatilis</i>	River bulrush	Plant	—	S1
<i>Sparganium eurycarpum</i>	Giant bur-reed	Plant	—	S3

Sources: Bird identification information from Fleming, 2000; Mammal identification information from Fort Belvoir files; Reptile identification information from Fort Belvoir files; Crustacean information from Hobson, 1996 and 1997; Insect information from Hobson, 1996 and 1997; Mollusk information from Hobson, 1996 and 1997; Plant information from Wells, 1999 and Hobson, 1996 and 1997. All species status information was updated according to Roble, 1999 and Killeffer, 2000.

**\*Virginia Status Listings:**

LE: Listed Endangered

LT: Listed Threatened

SC: Special Concern; animals that merit special concern according to the VDGIF.

**†Natural Heritage Rankings:**

S1: Extremely rare; usually 5 or fewer occurrences in the state; or may have a few remaining individuals; often especially vulnerable to extirpation.

S2: Very rare; usually between 5 and 20 occurrences; or few occurrences with many individuals; often susceptible to becoming endangered.

S3: Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

SH: Historically known from the state, but not verified for an extended period, usually more than 15 years; this rank is used primarily when inventory has been attempted recently.

SU: Status uncertain, often because of low search effort or cryptic nature of the element.

S\_B, S\_N: Breeding and nonbreeding status of an animal in Virginia, when they differ.

?: Indicates an uncertain ranking.

‡A vagrant species that does not breed on Fort Belvoir and has been documented on post less than four times.

### 12.2.5 Rare Ecological Communities

The ecological communities assessment (McCoy and Fleming, 2000) identified 17 community types on Fort Belvoir Main Post, four of which are ranked “very rare” or “extremely rare”, and three of which are ranked as “rare to uncommon”(Note, S1 = extremely rare; S2 = very rare and S3= rare to uncommon):

- Coastal Plain/Piedmont Acidic Seepage Swamp - G2, G3, S2
- Tidal Hardwood Swamp - G3, S3?<sup>5</sup>
- Tidal Shrub Swamp - G?<sup>5</sup>, S2?<sup>5</sup>
- Tidal Freshwater Marsh: Mixed Type - G-?<sup>5</sup>, S1
- Tidal Freshwater Marsh: Mud Flat Type - G?<sup>5</sup>, S3?<sup>5</sup>
- Tidal Freshwater Marsh: Wild Rice - Smartweed Type - G?<sup>5</sup>, S3?<sup>5</sup>
- Tidal Freshwater Marsh: Spikerush - Golden-club Type - G1G3, S1.

The ecological communities assessment identified existing and potential threats to the biodiversity of these wetland communities (McCoy and Fleming, 2000). The most significant threat is posed by invasive/exotic species. Aggressive invasive/exotic vegetation, such as *Phragmites australis*, marsh dewflower (*Murdannia keisak*), hydrilla (*Hydrilla verticillata*), and eulalia (*Microstegium vimineum*) were encountered in installation wetlands. The oriental mystery snail (*Cipangopaludina chinensis*), which can negatively alter vegetational habitat, was encountered throughout the installation. DCR-NHP also noted that these wetlands are vulnerable to stormwater-related problems (e.g., sedimentation), degraded water quality and boat wakes, as well as by beaver activity (Hobson, 1996).

## 12.3 ENDANGERED, THREATENED, AND RARE SPECIES MANAGEMENT

### 12.3.1 Endangered, Threatened, and Rare Species Management Recommendations

The results of the various surveys indicate that Fort Belvoir possesses a large number of rare plant and animal species (including the federal threatened/state endangered bald eagle, state endangered peregrine falcon, and state threatened wood turtle), and rare ecological communities. The surveys also indicate that the habitat areas for these species require protection. New development, shoreline disturbances, and waterfowl hunting activity are examples of threats to the habitat for bald eagle and peregrine falcon populations. Wood turtle habitat faces threats from the reduction of riparian forest buffers, which degrade water quality, increase stream flow and alter stream channels. The biodiversity of wetland ecological communities is threatened by the introduction of invasive/exotic species. Fort Belvoir's efforts to eliminate these threats should also address related impacts that have already occurred.

### 12.3.2 Endangered, Threatened, and Rare Species Management Actions to Date

The foundation of Fort Belvoir's endangered, threatened and rare species management is habitat conservation, consistent with the conservation recommendations of DCR-NHP (McCoy and

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<sup>5</sup> Those rankings still in question are yet to be determined by NHP because Virginia-wide surveys are not yet complete.

Fleming, 2000; Hobson, 1996; 1997). Much of the installation's bald eagle habitat, as well as the installation's rare wetland community types, and their associated rare plant and animal species, are contained within the ABWR. Similarly, some of the installation's wood turtle habitat is included within both refuges and within the Fort Belvoir Forest and Wildlife Corridor. The Fort Belvoir Master Plan designates the installation refuges, the corridor, wetlands and steep-sloped areas as "environmentally constrained areas." Such conservation land-use designations protect the habitat in these areas from loss to development or land disturbing training activities.

In recent years, Fort Belvoir began to address conservation and enhancement of native biodiversity within ecological communities by identifying and controlling threats from invasive/exotic species and from stormwater-related problems (Sections 9 and 7, respectively).

### 12.3.2.1 Bald Eagle Management

With the discovery of the bald eagle nest on Fort Belvoir in 1990<sup>6</sup>, Fort Belvoir implemented a bald eagle management program. The program focused primarily on the protection of nesting bald eagles and nest habitat. Measures to protect bald eagle nest habitat were established in the 1991 Fort Belvoir *Eagle Management Plan*. The ABWR was expanded to include the active nest site and associated protection area (Section 13).

In 2000, Fort Belvoir developed the Fort Belvoir *Bald Eagle Management Plan* (Paciulli, Simmons & Associates, Ltd., 2000a) to replace the 1991 *Eagle Management Plan*. The 2000 Plan expanded management actions to address conservation of all bald eagle habitat on post, not just nesting habitat. The *Bald Eagle Management Plan* was developed in accordance with the requirements of AR 200-3, and incorporated the management requirements and recommendations of the USFWS *Bald Eagle Guidance for Virginia* (U.S. FWS, 2000) and the VDGIF *Management Guidelines and Recommendations for Fort Belvoir* (Cline, 1996), both of which emphasize conservation of all bald eagle habitat, including foraging habitat (Table 12.3).

<b>Table 12.3: Bald Eagle Management Recommendations of the U.S. Fish and Wildlife Service and the Virginia Department of Game and Inland Fisheries</b>	
<b>Agency</b>	<b>Recommendation</b>
U.S. Fish and Wildlife Service Bald Eagle Guidance for Virginia (U.S. Fish and Wildlife Service, 2000)	<p>Establish primary and secondary nest management zones and a shoreline management zone.</p> <p>Within the primary nest management zone (750-foot radius around active nests), prohibit all activities during the breeding/nesting season, and prohibit any habitat modifications (e.g., clearcutting, development) at any time.</p> <p>Within the secondary nest management zone (1,320-foot radius around active nests), restrict activity during the breeding/nesting season, and limitations on habitat alterations.</p> <p>Conditions for shoreline management zones should be developed on a case-by-case basis.</p>

<sup>6</sup> There has been confirmed eagle nesting activity on Belvoir from 1936 until 1959. Historic nest sites are recorded in lower T-6, T-7 and T-10 (Cline, 1996).



Table 12.3: Bald Eagle Management Recommendations of the U.S. Fish and Wildlife Service and the Virginia Department of Game and Inland Fisheries	
Agency	Recommendation
<i>(continued)</i>	
Virginia Department of Game and Inland Fisheries Management Guidelines and Recommendations for Fort Belvoir (Cline, 1996)	<p>Establish management zones around active bald eagle nests and along the installation shoreline.</p> <p>Establish primary and secondary nest management zones at 750- and 1,320-foot radii, respectively, around active nests, and establish land use and activity restrictions specific to each zone (e.g., no clear cutting or construction within the primary zone; no human activity within the primary zone from November 15 through July 15).</p> <p>Protect shoreline by preserving a forest buffer up to 750 feet inland (300 feet minimum), and protect the designated "high use foraging area" from increases in boating activity.</p> <p>Undertake a public information effort to protect eagle foraging habitat from disturbance by human activity.</p>

Sources: U.S. Fish and Wildlife Service, 1998 and Cline, 1996

The *Fort Belvoir Bald Eagle Management Plan* (Paciulli, Simmons & Associates, Ltd., 2000a) established four major management actions:

- Designating specific eagle management areas (i.e., Active Nest Site Protection Area, Historic Nest Site Protection Area, High-Use Foraging Protection Area, and Occasional Use Foraging Protection Area (Figure 12.4), with area-specific management activities to protect the eagle and its habitat on Fort Belvoir (Table 12.4)
- Implementing habitat enhancement projects by correcting utility poles that pose an electrocution hazard, and performing timber stand improvements to improve potential nest habitat
- Developing and implementing an eagle awareness training program for installation personnel, and developing and implementing a public education program on bald eagles and their protection to minimize the risk of disturbance to eagles
- Continuous monitoring of bald eagle activity and bald eagle habitat on post, including the active nest site, potential nest habitats, and shoreline foraging and loafing areas.

#### 12.3.2.2 Wood Turtle Management

Since discovery of the wood turtle on Fort Belvoir in 1988, wood turtle management has focused primarily on habitat conservation. Conservation of wood turtle habitat, especially migratory corridors, was a major factor in the designation and delineation of the Fort Belvoir Forest and Wildlife Corridor.

### ***12.3.2.3 Peregrine Falcon Management***

As of 2000 no specific peregrine falcon habitat management activities have been undertaken. Except for the Tompkins Basin area, the entire Accotink Creek/Accotink Bay stream corridor below U.S. Route 1 is within the ABWR. This conservation land use designation protects this area from land disturbing activities, such as shoreline development.

### ***12.3.2.4 Rare Species and Rare Ecological Communities Management***

Conservation of rare plant and animal species and their habitats were important considerations in the establishment of the two installation refuges (ABWR and JMAWR). These refuge designations have effectively protected a large amount of the installation's rare wetland communities, and associated rare plant and animal species, from loss to development or training activities.

As addressed in Section 7, Fort Belvoir has initiated a watershed restoration program to correct stormwater problems within the installation stream corridors, and has begun to implement best management practices on construction projects. The first watershed restoration projects, undertaken in 1999 and 2000, focused on subwatersheds of the Accotink Bay freshwater tidal wetlands in an effort to help protect rare wetland communities and their associated rare plant and animal species by controlling sedimentation.

As addressed in Sections 9.3 and 10.3, Fort Belvoir has initiated an invasive/exotic vegetation management program. The first invasive/exotic vegetation management actions were undertaken in 1999 in an effort to control *Phragmites australis* in the Accotink Bay freshwater tidal wetlands to help protect rare wetland communities and their associated rare plant and animal species.

### ***12.3.2.5 Endangered and Threatened Species Law Enforcement***

Through its Memorandum of Agreement for Cooperative Law Enforcement between the U.S. Fish and Wildlife Service and the U.S. Army Garrison Fort Belvoir, dated 20 February 1996 (Appendix A), Fort Belvoir has one Special Agent within ENRD. The agreement is to provide mutual law enforcement benefits to the installation and to the Fish and Wildlife Service by sharing expertise, training, intelligence, information, and specialized equipment. The intent of this agreement is to provide the Special Agent with the authority to enforce all laws administered by the U.S. and the installation relating to fish, wildlife, and other natural resources. The agreement delegates authority to the Special Agent to enforce several specific federal laws on Fort Belvoir including the following: Lacey Act Amendments of 1981 (16 U.S.C., 3371-3378), Migratory Bird Treaty Act (16 U.S.C. 703-712), Migratory Bird Hunting and Conservation Stamp Tax Act (16 U.S. C. 718-718h), Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), Airborne Hunting Act (16 U.S. C. 742J-1), National Wildlife Refuge Systems Administrative Act (16 U.S.C., 668dd-668ee), Endangered Species Act of 1973 (16 U.S.C., 1531-1543), Marine Mammal Protection Act of 1979 (16 U.S.C., 1361-1384, 1401-1407), and Archeological Resources Protection Act of 1979 (16 U.S.C. 470a. (A)-(1) (A)).





- Bald Eagle Management Zone 1: 750 Feet
- Bald Eagle Management Zone 2: 1320 Feet

**Fort Belvoir Bald Eagle Management Areas**

- Active nest site protection zone
- Historic nest site protection zone
- Bald Eagle High Use Forage Area
- Bald Eagle Occasional Use Forage Area



**DESIGNATED BALD EAGLE  
MANAGEMENT AREAS on FORT BELVOIR**

SOURCE: PACIULLI, SIMMONS, and ASSOCIATES, LTD., 2000

FIGURE 12.4



Table 12.4 Bald Eagle Management Area Restrictions as Designated in the Bald Eagle Management Plan (depicted in Figure 12.4)							
Management Area	Land Area Designation	Land Use Development	Training Activities	Recreation Activities	Facilities Maintenance Activities	Land/Resources Management Activities	
Area 1: Active Nest Site Protection Area (all of W-7* and T-10* <sup>†</sup> ; lower part of W-1, at and above 100-ft contour level)	Incorporate T-10 into the ABWR.	No land-use changes for development (e.g., no land clearing or new facilities construction) in entire area.	No land disturbing training activities in entire area. No training activities within 750-ft radius of nest tree between November 15 and July 15. For Davison Army Airfield-controlled aircraft, no helicopter overflights under 1,000 ft altitude; no fixed wing overflights under 500 ft altitude over nest tree.	No hunting or other recreation activities within 750-ft radius of nest tree between November 15 and July 15. No new hiking trails within 1,320 – ft radius of nest tree.	Keep training road between W-7 and T-10 closed. Mark boundaries of W-7 and T-10 as Eagle Protection Area.	No land management activities within 1,320-ft radius of nest tree between November 15 and July 15. No timber clearcutting in entire area. No aerial pesticide spraying within 750-ft radius of nest tree. Access of Fort Belvoir personnel or representatives within 750-ft radius of nest tree between February 1 and July 15 must be coordinated with VDGIF and USFWS.	
Area 2: Historic Nest Site Protection Area (lower parts of T-6 and T-7 at and below 125-ft contour level)	Consider incorporating this area into the ABWR in the future.	No land-use changes for development (land clearing or new facilities construction).	No land disturbing training activities.	None	None	No timber clearcutting.	
Area 3: High Use Foraging Area Protection Area (extends a minimum of 750 ft inland from shoreline of upper Pohick Creek and Pohick and Accotink Bays. All of F-1* <sup>†</sup> , W-5 and W-6; lower parts of W-1 and W-2 at or below 25-ft contour level; lower part T-9)	Consider incorporating lower part of T-9 into the ABWR in the future.	No land-use changes for development (land clearing or new facilities construction).	No land disturbing training activities No shoreline training activities (e.g., landing craft, float bridge training).	No recreation other than hunting, fishing and low-intensity passive recreation. No launching or landing of any recreational watercraft.	None	No timber clearcutting.	

Table 12.4 Bald Eagle Management Area Restrictions as Designated in the Bald Eagle Management Plan (depicted in Figure 12.4)						
Management Area	Land Area Designation	Land Use Development	Training Activities	Recreation Activities	Facilities Maintenance Activities	Land/Resources Management Activities
(continued)						
Area 4: Occasional Use Foraging Area Protection Area (750 ft inland from shoreline of upper Pohick Creek, Gunston Cove, Potomac River and Dogue Creek (i.e., the remainder of Fort Belvoir shoreline not included in Area 3)	None.	None	None	None	None	No timber clearcutting.

Source: Paciulli, Simmons & Associates, Ltd., 2000a.

- \* W – Wildlife Area
- † T – Training Area
- # F– Floodplain Area

## **12.4 CONTINUING AND FUTURE ENDANGERED, THREATENED, AND RARE SPECIES MANAGEMENT**

Fort Belvoir intends to continue the management emphasis on conservation of endangered, threatened and rare species (and their habitats), and rare ecological communities. Fort Belvoir will continue to use conservation land-use designations to protect important habitat areas for these resources, and will continue to implement management actions, such as invasive/exotic species management, stormwater management and problem wildlife management, to control threats to these resources. Fort Belvoir will consider the potential for impacts to these resources when making land-use and operational decisions, especially with regard to bald eagles and wood turtles. Where practicable and consistent with installation mission Fort Belvoir will undertake actions to enhance habitat conditions for endangered, threatened, and rare species.

### **12.4.1 Management Objectives**

1. Protect against impact to federal- and state-listed species (e.g., bald eagle, wood turtle, and peregrine falcon). Conserve and enhance their habitat conditions.
2. Conserve habitats/populations of rare animal and plant species, and ecological communities that have been prioritized for conservation by the Virginia Natural Heritage Program.

### **12.4.2 Management Strategies**

1. Continue to obtain scientific information on endangered, threatened, and rare species, and their habitats, and on rare species and ecological communities to support our knowledge of these species and communities and their status, and to identify stresses and detect changes to their populations and/or habitats on post.
  - Continue to monitor federal and state species listings to identify changes in species listing status, and changes in species records for the Fort Belvoir area.
  - Complete the next installation-wide rare species inventory update on a 5-year cycle (in fiscal year (FY) 02). The inventory will entail field survey, records review and GIS datalayer development, consistent with the protocols used during the 1996 and 1997 baseline inventories. The update will allow for a comparison to update changes. Coordinate survey information with USFWS and VDGIF. Maintain the inventory in the installation GIS.
  - Continue to perform annual bald eagle surveys in accordance with the Bald Eagle Management Plan (Paciulli, Simmons & Associates, Ltd., 2000a): annual nest habitat surveys and seasonal foraging habitat surveys. Maintain the results in the installation GIS.



- Continue to perform year-round surveillance (i.e., close observation, in lieu of studies or monitoring projects) of bald eagles and their habitat to detect changes in presence/activity and potential impacting activities/conditions.
  - Develop and implement a baseline survey to characterize the on-post wood turtle population, and to evaluate habitat conditions. The survey will be used to develop and implement monitoring of wood turtles and their habitat on Fort Belvoir, as recommended by DCR-NHP (Hobson, 1996). Coordinate this monitoring program with the Huntley Meadows wood turtle monitoring program. Coordinate survey information with VDGIF and DCR-NHP. Maintain the results in the installation GIS.
  - Continue to coordinate with USFWS, VDGIF, DCR-NHP and other appropriate entities regarding protection requirements for, and current population and other information on, bald eagles and wood turtles, and for other listed and rare species, and rare ecological communities, as they may be encountered on Fort Belvoir.
  - Develop and implement a study to evaluate the *Stygobromus phreaticus* (northern Virginia well amphipod), as recommend by the Natural Heritage Program (Hobson, 1997).
  - Develop and implement a program to monitor rare plant and animal species, and rare ecological communities, as recommended by DCR-NHP (Hobson, 1996; 1997; McCoy and Fleming, 2000). Monitoring will address populations and habitat conditions, and will be developed to assess integrity and to detect existing and potential impacts. Maintain the monitoring results in the installation GIS. Areas to be considered for monitoring include the freshwater tidal wetlands (W-5, W-6, W-1, W-2, W-3); the acidic seepage swamp wetlands (lower T-9, lower T-7, W-1, eastern T-16 and lower HEC); the T-17 ravine; and, the freshwater marsh of W-4.
  - Perform localized and/or issue-specific rare species/communities studies/monitoring as needed to support resource management, or specific installation projects, such as new development or changes to land-use practices. Coordinate the survey results with VDGIF and DCR-NHP. Maintain the results in the installation GIS.
2. Continue to set aside habitat areas for endangered, threatened, and rare species, and rare ecological communities, consistent with DoD policy for setting aside areas for conservation as “Special Natural Areas” (Section 13). As of 2000, Fort Belvoir has three such areas: two refuges and the Forest and Wildlife Corridor. Continue to designate these set-aside areas, as well as wetlands and steep-sloped areas, as “environmentally constrained to development” in the installation Master Plan. Consider modifying the boundaries of the refuges and/or establishing a buffer for the refuges, to protect habitat areas for rare resources with high conservation priorities, as designated by DCR-NHP. Considerations should include the following:
- Expanding the current ABWR (Figure 4.1) to include the land area of F-1, T-9, T-7, T-10 and T-6 below the 125-foot contour (Figure 2.2), as recommended in the *Bald Eagle Management Plan*. This coincides with the Historic Nest Protection Area (Figure 12.4), and would result in all of the three major eagle management areas

(Active Nest Site Protection Area, Historic Nest Site Protection Area, and High Use Foraging Protection Area) being incorporated into the refuge. It would also include all of the rare wetland communities associated with the Pohick Creek-Pohick Bay-lower Accotink Creek-Accotink Bay wetland complex into the refuge. This area represents part of the Pohick / Accotink conservation site recommended by DCR-NHP (Figure 8.2) (Hobson, 1996).

- Expanding the current JMAWR (Figure 4.1) to incorporate the wetlands of eastern T-16 (Figure 2.2 and 8.1) and the lower part of HEC. This would incorporate all of the rare wetland communities associated with the upper Dogue Creek-Mulligan Pond wetland complex into the refuge. This area represents all of the Dogue Creek conservation area recommended by DCR-NHP (Figure 8.2) (Hobson, 1996).
  - Defining and designating buffer areas adjacent to ABWR and JMAWR to protect resources within the refuges. Develop land use considerations for these buffer areas.
  - Designating part of T-17 as a conservation area within the Tompkins Basin Recreation Area. This area includes the ravine site recommended by DCR-NHP for conservation to protect the northern Virginia well amphipod (Figure 8.2) (Hobson, 1997).
3. Continue to implement the bald eagle management actions set forth in the *Bald Eagle Management Plan* (Paciulli, Simmons & Associates, Ltd., 2000a).
- Continue to manage the four designated eagle management areas on Fort Belvoir: Active Nest Site Protection Area, Historic Nest Site Protection Area, High-Use Foraging Area, Occasional Use Foraging Area (Figure 12.4 and Table 12.4) to protect eagle habitat on post.
  - Continue to implement bald eagle habitat enhancement projects. These include correcting electrocution hazards by installing raptor guards, or re-configuring or replacing all electric poles that pose an electrocution hazard, and making selective timber cuts in planted pine stands to improve nest habitat conditions.
  - Develop and implement an eagle awareness-training program for installation personnel, and a public education program, including information displays and handout materials, on bald eagles to safeguard against disturbance to bald eagles.
4. Develop, maintain, and implement Endangered Species Management Plans for all federal and state-listed species, and federal candidate species in accordance with the requirements of AR 200-3.
- Complete the revisions to the *Bald Eagle Management Plan* on a 5-year cycle (FY 05). Perform an annual review of the plan.
  - Develop a wood turtle management plan. Use the results of the installation baseline wood turtle survey, and coordinate with VDGIF, DCR-NHP, and other appropriate entities to develop the plan. This plan will stress habitat protection, and will explore conservation land-use designations to protect habitat. (The wood turtle, a highly

mobile species having varied habitat requirements, will have management issues associated with preservation of migratory corridors, as well as protection of nesting and hibernating habitat.) The management plan will include a long-term monitoring effort, and will explore using opportunities for coordinating/integrating installation monitoring and management efforts with regional efforts. Perform an annual review of the plan.

- Develop a management plan for any other federal-, or state-listed species, or federal candidate species that occur on post.
5. Continue to implement actions to control threats to rare plant and animal habitats, and rare ecological communities:
- Continue to emphasize rare plant and animal species habitats, and rare ecological communities when performing invasive/exotic species management. For example,
    - o Continue to monitor and control *Phragmites australis* (phragmites), as recommended by DCR-NHP (Hobson, 1996; McCoy and Fleming, 2000).
    - o Develop and implement a monitoring and control program for other invasive/exotic species such as marsh dewflower (*Murdannia keisak*) and hydrilla (*Hydrilla verticillata*), which could impact rare wetland species and communities.
    - o Continue to perform surveillance for outbreaks of other invasive/exotic vegetation that could impact the rare plant communities, as recommended by DCR-NHP (Hobson, 1996; McCoy and Fleming, 2000).
  - Continue to emphasize rare plant and animal species habitats, and rare ecological communities when performing watershed restoration projects. For example, complete the watershed restoration projects associated with lower Accotink Creek and Accotink Bay, as recommended by Landgraf (1999).
  - Continue to control the risk of problem wildlife impacts to rare plant and animal species habitats, and rare ecological communities. For example:
    - o Continue to control the deer population through the hunting program.
    - o Monitor beaver activity to detect impacts to rare wetland communities. Develop and implement protection measures if impact thresholds have been exceeded, as recommended by DCR-NHP (Hobson, 1996; McCoy and Fleming, 2000).
6. Continue to use the installation project and activity review process to incorporate threatened, endangered, and rare species/communities conservation requirements into all phases of facilities siting, construction, renovation, operation, maintenance, and demolition activities; in reviewing and supporting military training and testing activities; and in reviewing and responding to outdoor recreation, environmental education, scientific research and study, and all other types of land area access and use requests.
- Review and revise, as needed, the Fort Belvoir *Environmental Protection Specifications* applicable to construction projects to ensure that they include threatened, endangered, and rare species/communities protection provisions.

- Review and revise as needed, the *Fort Belvoir Environmental Checklist* to address threatened, endangered, and rare species/communities protection.
  - Incorporate threatened, endangered and rare species/communities conservation strategies and specifications into utilities privatization, and all other privatization and outsourcing actions, as appropriate.
  - Develop recommendations for a facilities siting/design review committee to include representatives from ENRD, Master Planning and the Contract Management Division. The committee should develop and participate in a design review process to ensure consideration of threatened, endangered and rare species/communities protection in all siting and design decisions.
  - Continue to include threatened, endangered and rare species/communities protection as part of the Excavation Permit and Demolition Permit review processes.
  - Continue to include threatened, endangered and rare species/communities protection in all real estate actions (e.g., outgrants, leases, rights of entry), as appropriate.
  - Review and revise the Fort Belvoir Training Regulation as needed to address threatened, endangered and rare species/communities protection.
7. Develop and participate in regional partnerships for threatened, endangered and rare species, and rare ecological communities protection.
- Initiate a cooperative effort with Pohick Regional Park regarding bald eagle protection (especially with regard to marina operations) and Huntley Meadows regarding the wood turtle protection. Include additional neighbors in this cooperation as appropriate.
  - Continue to coordinate with and provide support to the Mason Neck Bald Eagle Survey program, a volunteer program.
  - Continue to coordinate with and provide support to the VDGIF annual bald eagle nest survey and annual Potomac River shoreline survey. Continue to coordinate installation eagle monitoring information with VDGIF.
  - Continue to review local and regional off-post actions for potential to impact on-post listed and rare species, and rare ecological communities.
8. Continue to perform agency coordination on installation actions potentially affecting endangered, threatened, or rare species, or rare ecological communities.
- Continue to coordinate with USFWS, National Marine Fisheries Service (NMFS), VDGIF, and DCR-NHP regarding the potential for installation actions to affect endangered, threatened, or rare species, or rare ecological communities.
  - Perform Endangered Species Act Section 7 Consultation with the USFWS or NMFS on installation actions that may affect federally listed species.



- Investigate and enforce violations of federal and state endangered species statutes and regulations.
  - Coordinate with USFWS, NMFS and VDGIF on listed species mortalities.
9. Continue to provide technical assistance for emergency situations, such as uncontrolled fires, that threaten listed or rare species.
  10. Continue to respond to requests for technical information from on-post and off-post entities, as appropriate.
  11. Continue to investigate and enforce violations of federal and state laws and regulations, as well as DoD, DA, and Fort Belvoir policies.